

#3



10064683-102102

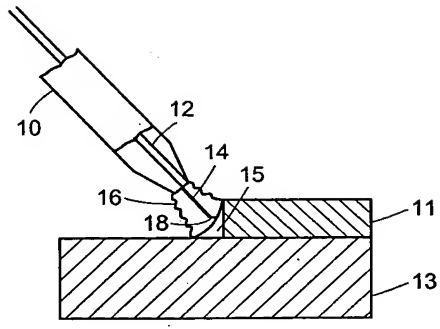


FIG. 1



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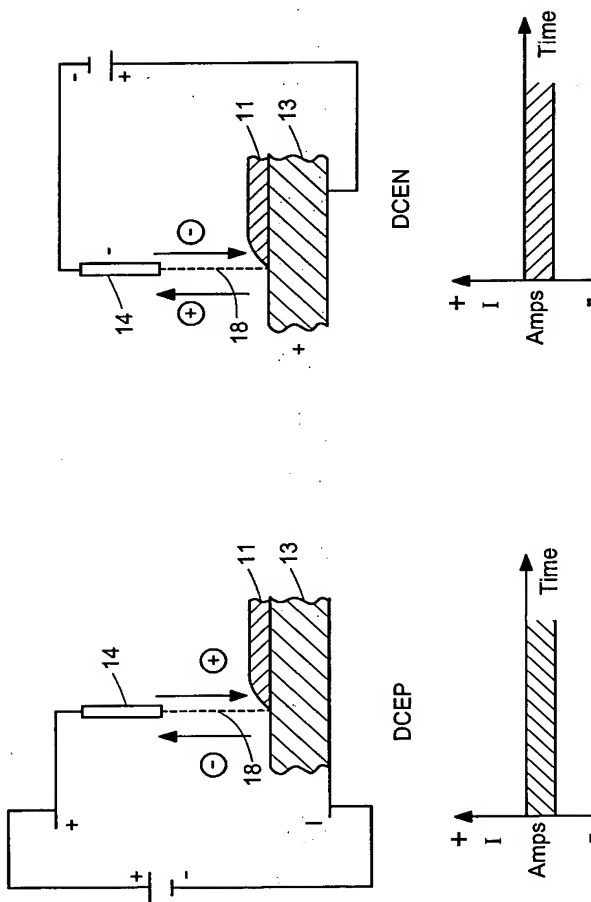


FIG. 2A

FIG. 2B

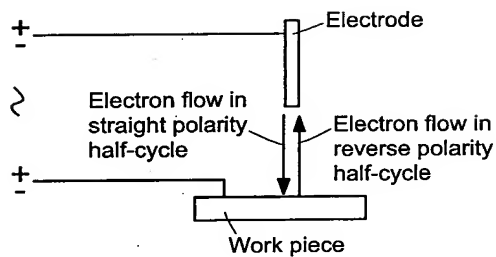


FIG. 3A

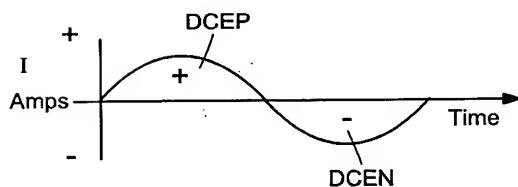


FIG. 3B

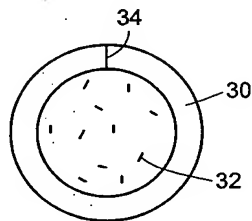


FIG. 4

10064683.102102



Application Serial No: 10/064,683

Title: Flux-Cored Wire Formulation for Welding

Inventor: Anthony Nikodym

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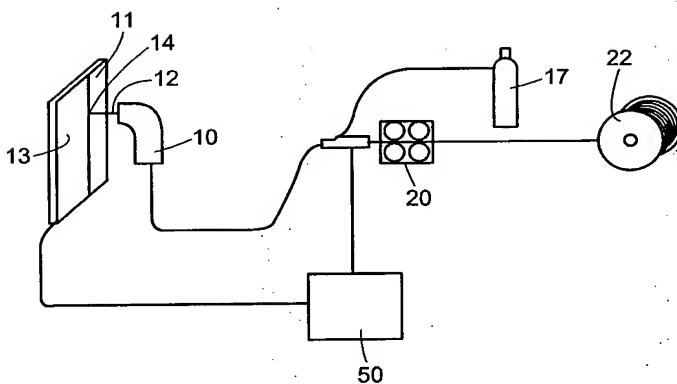


FIG. 5

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AWS A5.18/A5.18M:2001

FIG. 6

Table 2
Chemical Composition Requirements for Weld Metal from Composite Electrodes

AWS Classification ^a		UNS Number ^b	Shielding Gas ^c	Weight Percent ^d									
A5.18	A5.18M			C	Mn	Si	S	P	Ni ^e	Cr ^f	Mo ^g	V ^h	Cu
Multiple Pass Classifications													
E70C-3X	E48C-3X	W07703	75-80% Ar/Balance CO ₂ or CO ₂	0.12	1.75	0.90	0.03	0.03	0.50	0.20	0.30	0.08	0.50
E70C-6X	E48C-6X	W07706	75-80% Ar/Balance CO ₂ or CO ₂	0.12	1.75	0.90	0.03	0.03	0.50	0.20	0.30	0.08	0.50
E70C-Q(X)	E48C-Q(X)		f						Not Specified ⁱ				
Single Pass Classifications													
E70C-GS(X)	E48C-GS(X)		f						Not Specified ⁱ				

Notes:

- The final X shown in the classification represents a "C" or "M" which corresponds to the shielding gas with which the electrode is classified. The use of "C" designates 100% CO₂ shielding (AWS A5.32 Class SQ-C). "M" designates 75-80% Ar/balance CO₂ (AWS A5.32 Class SQ-AC-Y, where Y is 20 to 25). For E70C-Q [E48C-Q] and E70C-GS [E48C-GS], the final "C" or "M" may be omitted if these gases are not used for classification.
- SAE/ASTM Unified Numbering System for Metals and Alloys.
- Use of a shielding gas other than that specified will result in different weld metal composition.
- Single values are maximums.
- The sum of Ni, Cr, Mo, and V shall not exceed 0.50%.
- Shielding gas shall be as agreed upon between purchaser and supplier, unless designated by the C or M suffix.
- Composition shall be reported; the requirements are those agreed to between purchaser and supplier.
- The composition of weld metal from this classification is not specified since electrodes of this classification are intended only for single pass welds. Dilution, in such welds, usually is quite high.



201201-28949001

Table 2
Chemical Composition Requirements for Weld Metal from Composite Electrodes^a

AWS Classification ^d	UNS Number ^e	Weight Percent ^{b,c}											Other Elements Total		
		C	Mn	Si	P	S	Ni	Cr	Mo	V	Ti	Zr		Al	Cu
Manganese-Molybdenum Weld Metal															
E90C-D2	W19230	0.12	1.00-1.90	0.90	0.025	0.030	—	—	0.40-0.60	—	—	—	—	0.35	0.50
Chromium-Molybdenum Weld Metal															
E70C-B2L	W52130	0.05	0.40-1.00	0.25-0.60	0.025	0.030	0.20	1.00-1.50	0.40-0.65	—	—	—	—	0.35	0.50
E90C-B2	W52030	0.05-0.12	0.40-1.00	0.25-0.60	0.025	0.030	0.20	1.00-1.50	0.40-0.65	—	—	—	—	0.35	0.50
E90C-B3L	W53130	0.05	0.40-1.00	0.25-0.60	0.025	0.030	0.20	2.00-2.50	0.90-1.20	—	—	—	—	0.35	0.50
E90C-B3	W53030	0.05-0.12	0.40-1.00	0.25-0.60	0.025	0.030	0.20	2.00-2.50	0.90-1.20	—	—	—	—	0.35	0.50
Nickel Steel Weld Metal															
E80C-N11	W21030	0.12	1.50	0.90	0.025	0.030	0.80-1.10	—	0.30	—	—	—	—	0.35	0.50
E70C-N12	W22030	0.08	1.25	0.90	0.025	0.030	1.75-2.75	—	—	—	—	—	—	0.35	0.50
E80C-N12	W22030	0.12	1.50	0.90	0.025	0.030	1.75-2.75	—	—	—	—	—	—	0.35	0.50
E80C-N13	W23030	0.12	1.50	0.90	0.025	0.030	2.75-3.75	—	—	—	—	—	—	0.35	0.50
Other Low-Alloy Weld Metal															
Not Specified ^f															

Notes:

- Chemical requirements for composite electrodes are based on analysis of their weld metal in the as-welded condition and using the shielding gas specified in Table 3.
- The weld metal shall be analyzed for the specific elements for which values are shown in this table. If the presence of other elements is indicated in the course of this work, the amount of these elements shall be determined to ensure that their total (excluding iron) does not exceed the limit specified for "Other Elements, Total."
- Single values shown are maximums.
- Solid electrodes are generally recommended for gas tungsten arc welding (GTAW) or plasma arc welding (PAW).
- SAE/ASTM Unified Numbering System for Metals and Alloys.
- In order to meet the requirements of this G classification, the electrode must have as a minimum of one or more of the following: 0.50 percent chromium, 0.30 percent nickel, or 0.20 percent molybdenum. Composition shall be reported; the requirements are those agreed to by the purchaser and supplier.

FIG. 7